Intel® Storage Server SSR212MC2

June 2007

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The Reseller Business Opportunity

Customers have huge storage needs

- iSCSI & SATA/SAS gaining momentum with SMB market

Take revenue from the incumbents

- Storage industry evolution is similar to volume servers
- The industry is evolving to modular, networked, open standards-based storage platforms

A differentiated solution with higher margins

Customers that grow in value

- Establish footprint that generates low effort repeat business
- 25% of customers repeat purchase within 4 months
- Repeat purchase typically larger than initial purchase
- 35% revenues can be from repeat buyers

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Opportunities for Selling

- If your customer…
  - Has no backup solution (RAID is not a back up solution)
  - Wants storage consolidation: customer has a storage solution, but it is fragmented and difficult to manage
  - has lots of data to store, and his storage needs are growing exponentially
  - is concerned about business continuity (if he isn't, ask him what his plans are)

- If you are…
  - Interested in selling services

Any time you sell a server or workstation, ask for the storage sale!

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SSR212MC2 Overview

Quad-core based Storage Server

- OEMs can integrate SW to configure as
  - DAS, NAS or SAN appliance
  - Application server
- Intel S5000PSL baseboard
  - Supports 1 or 2 dual core Intel® Xeon® processors
  - Supports 1 or 2 quad core Intel® Xeon® processors
  - Supports two 2 ½" boot HDDs
- 2U form factor, 12 hot-swap HDDs
  - 3 ½" SATA 3.0Gbps (7.2k or 10k RPM)
  - SAS (10k or 15k RPM)
- Enclosure management SW
- External SAS JBOD expansion
  - 2u 12 HDD or 3u 16 HDD
- Validated OS's include
  - Windows & Linux (RedHat and SuSe)
  - Microsoft Windows Storage Server R2

Add-in Card Options

- 10 GbE
- Fibre Channel
- Infiniband

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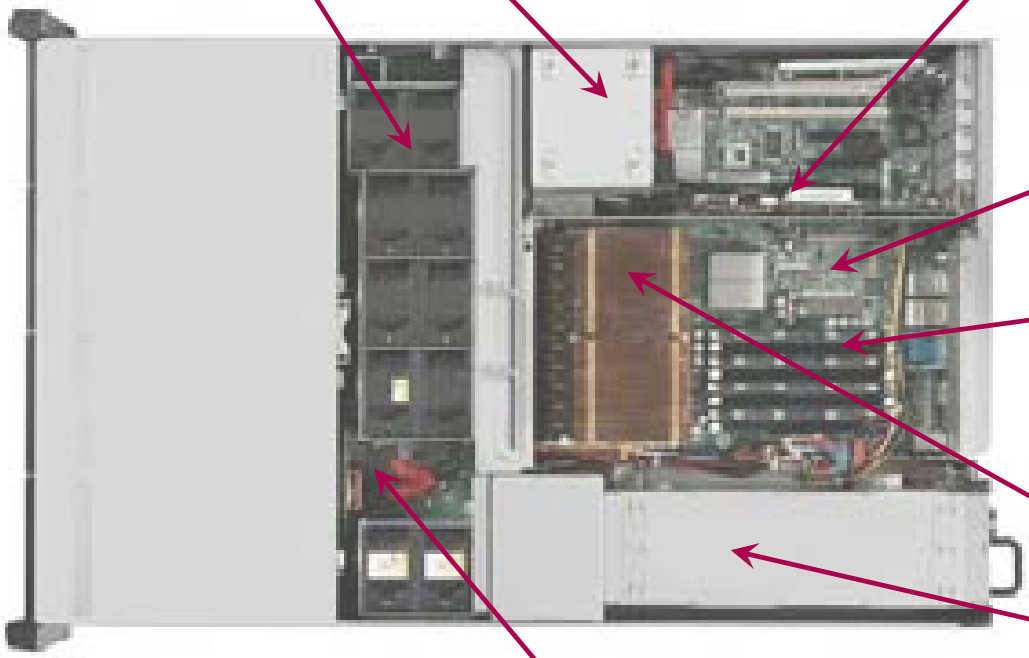
SSR212MC2 Picture HW Key Features



Hot Swap Fans

2 ½" SAS or SATA Boot drives

SCRSAS144e SAS RAID controller

S5000PSLSAS Server Board

Up to 32GB Memory

1 or 2 Woodcrest or Clovertown CPUs

Redundant-capable 850 Power Supplies

SAS Expander

Expansion Slots

- 1 PCI e x8 or 2 PCI e x8 (Non Raid)
- 2 PCI ex4
- 1 or 2(Non Raid) PCI-X 133/100MHz

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Hardware Components

What comes in the box - SSR212MC2RNA

- 2U chassis
- Intel Server Board SL5000PSL
- Twelve hard disk drive carriers
- One Intel RAID controller with battery backupSRCSAS144E (SSR212MC2R)*
- Dual Intel PRO/1000 network connections
- 850W power supply
- Hot-swappable fans (Q3)

Optional

- Second power supply for full redundancy

What's needed

- Processors
- RAM (FBDIMMS)
- OS and storage software
- Hard drives (SATA or SAS)
- external USB CD-ROM drive and external USB floppy drive (for installing operating system)

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Enhanced Reliability HDDs from Intel

- Commodity SAS & SATA drives can be used
  - Seagate, Hitachi, Maxtor , Western Digital
  - Order from the Distributor of your choice
  - Check out the THOL for a complete list of supported drives

- **http://support.intel.com/support/motherboards/server/ssr212mc2/index.htm**

- Or, order the drives from Intel as an accessory
  - Additional testing, for enhanced reliability
  - Improved customer satisfaction
    - Reduced infant mortality of HDDs by up to 2x
    - Reduce your warranty claims costs
  - AMCSAS300: 300GB SAS 3.0 Gbps
  - AMCSATA750: 750GB SATA 3.0Gbps

Benefits: Additional testing for increased reliability, reduced warranty claims costs, easy to install

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SSR212MC2 Usage Models

Flexible Server Solutions

3rd Party Application Software

=

- Application server
- Database server
- Email server
- SAN
- NAS
- DAS
- Virtual Tape Library

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SSR212MC2 as a Server

Customer needs storage area network cluster

Database

RedHat Linux + + MySQL

Customer needs Mail Server with large amount of storage

Exchange

Windows 2003 Server With Exchange +

Customer needs SQL Server with expandable Storage

SQL

Windows 2003 Server With SQL +

JBOD

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SSR212MC2 as a Storage Appliance

Customer needs storage area network cluster

SAN

FalconStor IPStor +

Server +

Customer needs a network attached storage server

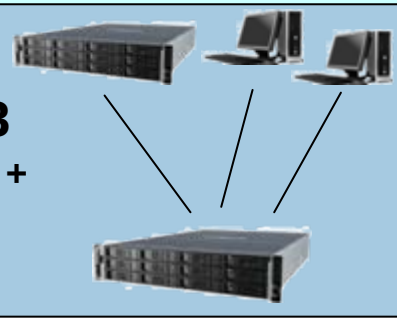
NAS

Bsquare Windows 2003 Storage Server +

Customer needs Universal Storage: NAS and SAN

NAS and SAN

Bsquare Windows 2003 Storage Server +



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Intel® Storage Server SSR212MC2
Supported Operating Systems(EM64T, IA)

- Microsoft* Windows* Server 2003 Enterprise Edition, R2.
- Microsoft* Windows* Storage Server 2003, R2.
- Microsoft* Windows* Unified Data Storage Server
- Red Hat* Enterprise Linux* AS 4, Update 2
- SuSE* Linux Enterprise Server 9.0, RC5/SP3 .

Note: Open-E runs on Debian*. Wasabi runs on FreeBSD*
Those operating systems are not tested

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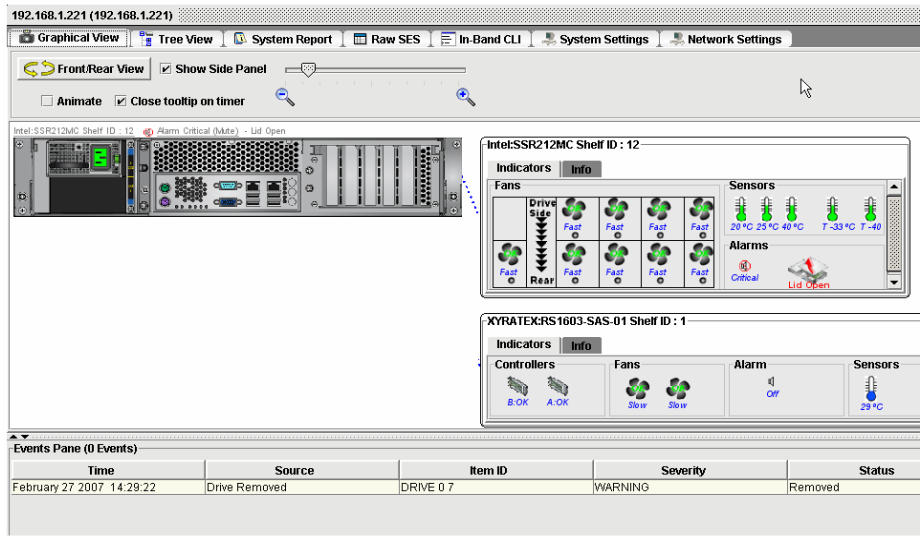
Storview® Enclosure Management Software

- **Ease of use management and flexible configuration**
- **Graphical interface for centralized monitoring**
  - **Drives, IO modules, Fan Speed, Temperature & power supplies**
- **Easy diagnosis of RAID problems**
- **HW Alerting:**
  - **Information Warning, Critical and Failure**



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Storview Main Screen

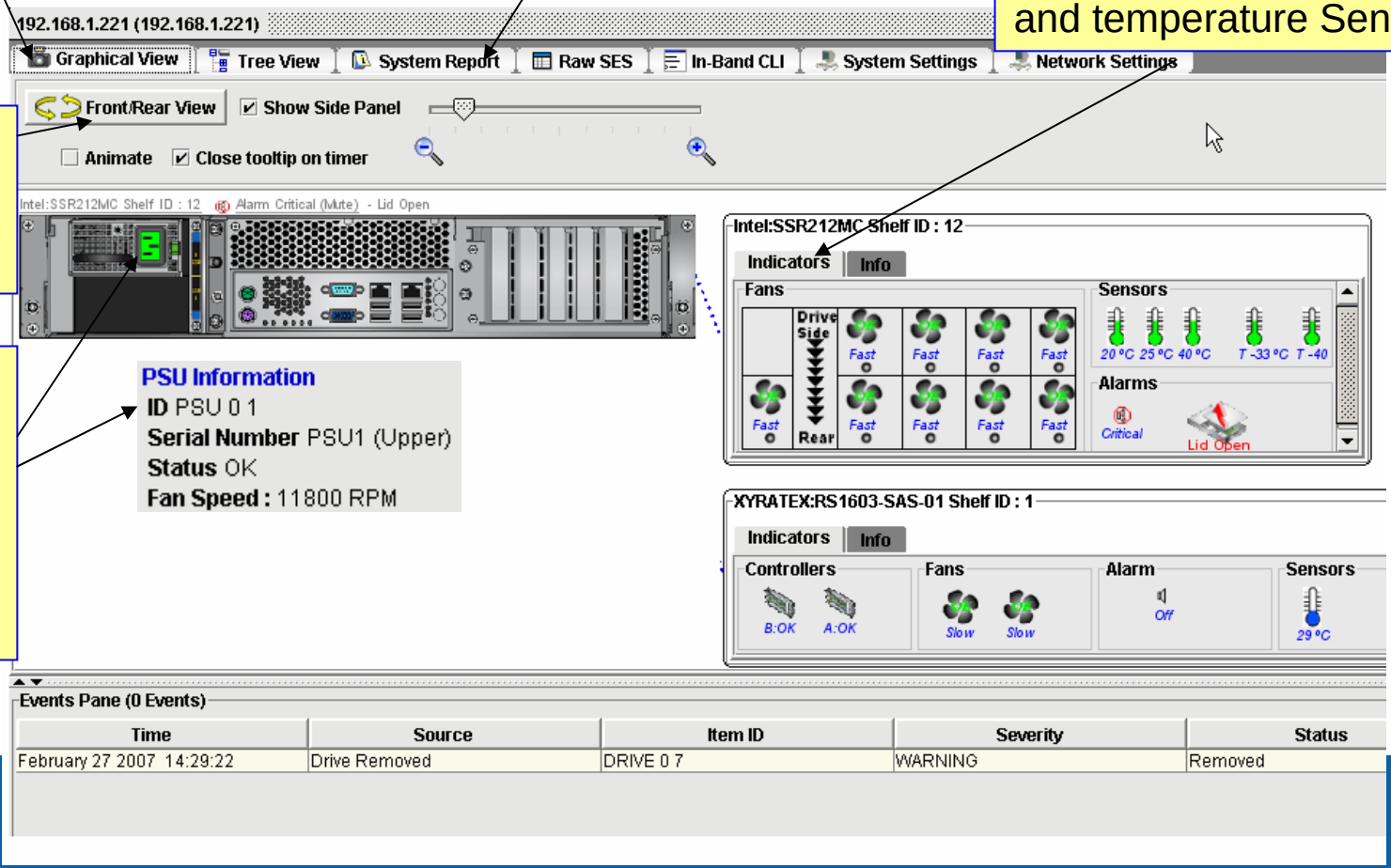
The Graphical View Shows the physical representations of your enclosure

The Row of buttons at the top change the contents of the main window giving access to different functions

Displays information about the components they contain such as controllers, fans, alarms and temperature Sensors

Reverses View Of the Enclosure

Information on any components available by running mouse over them



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Hardware Boot Options

- Third Party Storage Software Deployed on DOMS
- **Boot Drive Options:**
  - Load on Virtual Disk stored on Drive Bays
  - One or Two 2.5” SATA or SAS Boot Drives
  - IDE DOM
  - USB Flash Drive or USB Header DOM
  - USB Flash Drive SATA
  - SATA DOM
- 12V Power needed from Boot Drive Module for IDE and SATA DOMs

Virtual Disk

Hard Disk

Disk on Module(IDE)

USB Flash Drive

SATA DOM

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Intel® Enabled Server Acceleration Alliance (ESAA)

A collaborative alliance of OEM's/resellers and application vendors delivering validated server solutions to the end-user market.

ESAA enhances OEM/channel competitiveness

- **Certifies** the white box so the OEM does not have to
- **Engineering validation** costs removed
- **Recommended customer solutions** that work
- **Speed** time-to-market

Create new links between independent vendors and OEMs

- **Increased sales opportunities** in new market verticals
- **Intel as ecosystem** match maker

http://www.intel.com/go/esaa

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Backup

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Partial ISV Contact List

Company	Product Name	Description	URL	Where to Buy
	StorTrends® iTX	*Dual Dialect Technology – Supports NAS + IP-SAN*	www.ami.com	1-800-U-BUY-AMI
	Data Storage Server (DSS)	*All-in-one software for centralized IP-storage management*	www.opene.com	www.open-e.com/buyinus 1 770 881 7680
	IPStor® NSS, CDP & VTL SW Appliance Kits	*Software Appliance Kits to enable Network Storage Services, Continuous Data Protection and Virtual Tape Library functionality on Intel Storage Platforms.*	www.falconstor.com	1-866-NOW-FALC (1-866-669-3252)
	Storage Builder® for IP-SAN Storage Builder® for NAS	*iSCSI and NAS storage management and middleware software that enables organizations to build IP-based storage solutions using standard Intel platforms.*	www.wasabisystems.com	sales@wasabisystems.com 757-248-9601 option 1 Bell Micro SKUs: IP-SAN: O036-12L-IM-230 NAS: O036-12L-NM-230

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Example: Storage

Intel® Storage Systems

SSR212MC2 (McKay Creek)

SSR212MC2 Overview

Bensley-based Storage Server

OEMs can integrate SW, to configure as
- DAS, NAS or SAN appliance
- Application server

Intel S5000PSL (Star Lake) baseboard
- Supports 1 or 2 dual core Intel® Xeon® (Woodcrest) processors
- Supports 1 or 2 quad core Intel ® Xeon® (Clovertown) processors
- Ships with 1 Intel SRCSAS144e (Boiler Bay) RAID card
- Supports two 2 ½" boot HDDs or boot from DOM

2U form factor, 12 hot-swap HDDs
- 3 ½" SATA 3.0Gbps (7.2k or 10k RPM)
- SAS (10k or 15k RPM)

SES compliant enclosure management FW

External SAS JBOD expansion
2u 12 HDD or 3u 16 HDD

Validated as a high performance storage platform utilizing the Wasabi Storage Builder® for IP-SAN or NAS

PRODUCT SUMMARY

The Intel storage system SSR212MC2 (McKay Creek) is a flexible hardware platform with support for the enabled applications from Wasabi Storage Builder® internal storage (DAS) or as a dedicated networked storage appliance (NAS or SAN).

The SSR212MC2 is a 2u rackmount storage server that supports 12 enterprise-class SAS or high-capacity SATA HDDs. This PCIe-based platform supports fully buffered DIMMs and upto 2 high-performance dual core or quad core Intel® Xeon™ processors. Flexible network connectivity includes Ethernet, Fibre Channel or Infiniband via add-in cards.

Easy-to-use enclosure management GUI, or optional API extensions for ISV applications, allows users to monitor system components such as drives, fans, power supplies and CPUs.

Support for either an optional 2u/12 HDD or a 3u/16 HDD JBOD provides for affordable capacity expansion as your customer's business needs grow.

Intel® Storage Systems

Unleach the power

SSR212MC2
(McKay Creek)

The Power of Wasabi Storage Builder for NAS

With Wasabi Storage Builder you can immediately convert the Intel® Storage System into a NAS appliance or NAS head end by simply plugging a Compact Flash device into the IDE port (standard hard drive connector) of the motherboard and connecting the system to an Ethernet LAN. Storage configuration is quickly accomplished through a powerful, password protected GUI from any machine on the network. Data reliability is ensured through the use of supported RAID (Redundant Array of Independent Disks) controllers. Multiple drive types are supported, providing the flexibility to realize various price and performance objectives.

Storage Builder® works with all operating systems

Windows, Linux, solaris, HP-UX, AIX L

Integrated WasabiRAID™ Delivers Even More Flexibility and Cost Benefits

WasabiRAID™ is a powerful RAID engine that leverages the speed of modern processors to deliver maximum performance while protecting critical data. WasabiRAID supports RAID Levels 0, 1, 10, 5, 50, and spanning. Nested RAID levels can be created by incorporating logical disks created with a RAID HBA; for example, mirror two RAID controllers for fault tolerance at the controller level. Features such as hot spare, hot swap, and background rebuilds maximize system uptime and minimize windows of vulnerability in the event of a hard disk failure.

The Power of Wasabi Storage Builder

Wasabi Storage Builder saves you time and money. While other IP-SAN solutions require the purchase and installation of Windows™ or Linux, Wasabi Storage Builder delivers everything you need in a self-contained, bootable Flash-based device using Wasabi Flashware technology. A tightly-integrated set of software provides

BELL MICRO

The last peace of the puzzel

$500.00 rebate from your puchase of a Intel® Storage System SSR212MC powered by Wasabi Storage Builder® IP-SAN or NAS

Name
Address
Phone

Corporate Office, Sales & Marketing
1941 Ringwood Avenue
San Jose, CA 95131
phone 408.451.9400
fax 408.451.1600
toll free 800.800.1513

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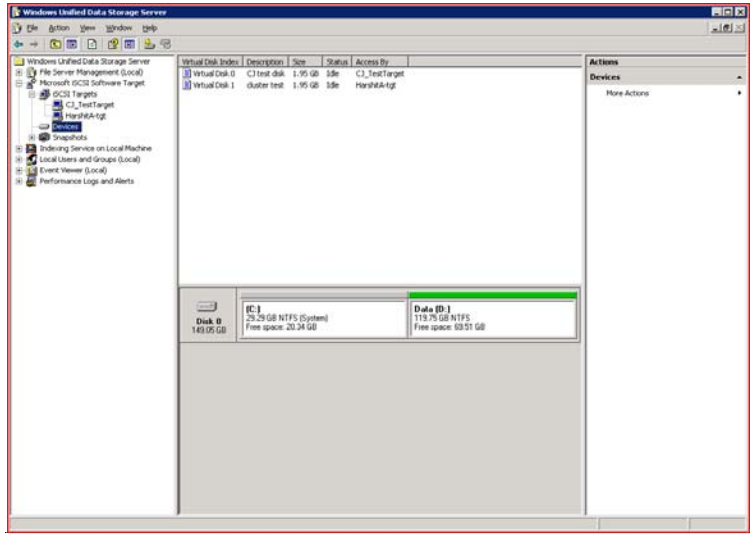
Microsoft Windows Unified Data Storage Server 2003

- Extension to Windows Storage Server R2
- Single storage platform suitable for SAN, NAS, NFS
- The Provision Storage Wizard simplifies the tasks for configuring and setting up Storage Servers
- Microsoft Management Console (MMC) snap-in that integrates all storage-management tools


Windows Unified Data Storage Server
File Action View Window Help
Windows Unified Data Storage Server
File Server Management (Local)
Microsoft iSCSI Software Target
iSCSI Targets
C3_TestTarget
HarshitA-tgt
Devices
Snapshots
Indexing Service on Local Machine
Local Users and Groups (Local)
Event Viewer (Local)
Performance Logs and Alerts
Virtual Disk Index | Description | Size | Status | Access By
Virtual Disk 0 | C3 test disk | 1.95 GB | Idle | C3_TestTarget
Virtual Disk 1 | cluster test | 1.95 GB | Idle | HarshitA-tgt
Actions
Devices
More Actions
Disk 0
149.05 GB
(C:)
29.29 GB NTFS (System)
Free space: 20.34 GB
Data (D:)
119.75 GB NTFS
Free space: 69.51 GB

Incorporates Microsoft iSCSI Software Target

- Allows iSCSI Target for file (NAS), print server, and block level storage (SAN)

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Wasabi Storage Builder®

Storage Builder®

- Storage Virtualization & Management
- NAS or IP-SAN Software
- Bootable OS

Boots from compact flash using Wasabi Flashware® Technology

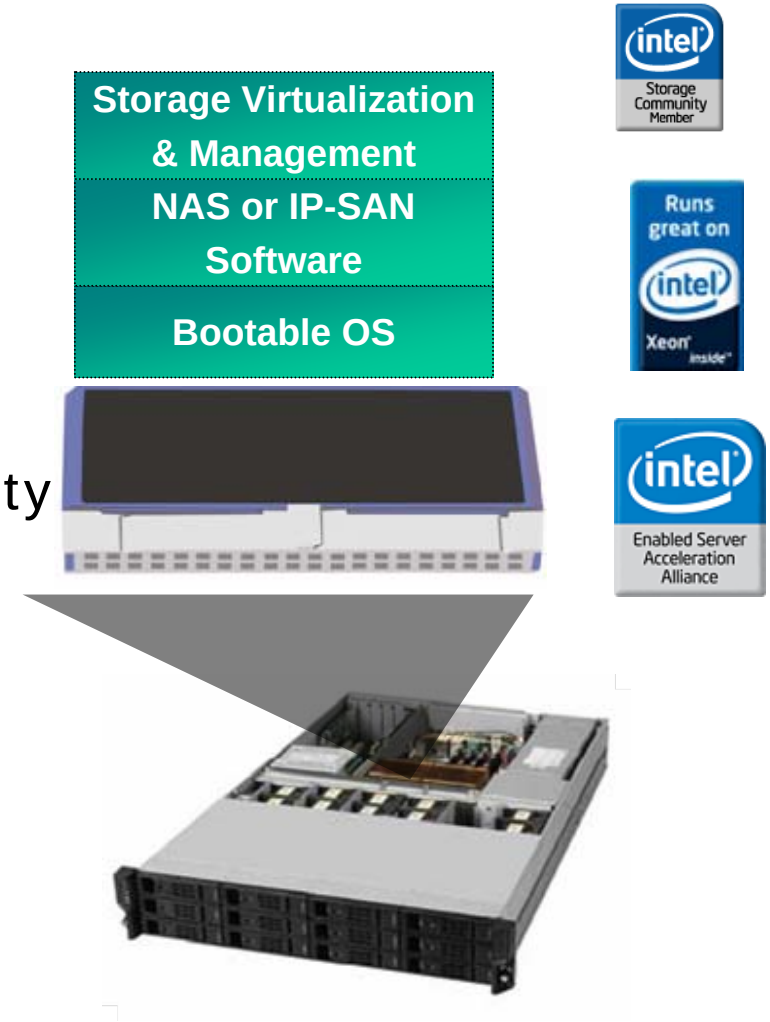
- More reliable; doesn't use capacity on drives

Integrated WasabiRAID™

- Reduced BOM cost
- Additional levels of redundancy

Provides flexibility for storage vendor differentiation

- Branding and customization



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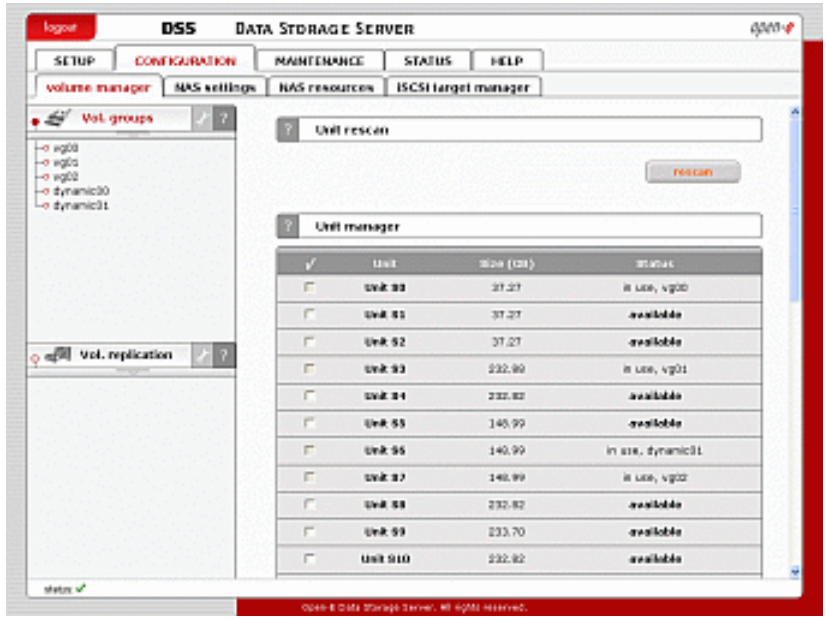
Open-E Universal Data Storage Solution

All-in-one IP-Storage OS offering both NAS and iSCSI SAN

- **iSCSI Initiator / iSCSI Target**
- **Volume Replication**
  - **Multiple Network Interface Card (NIC) support**
    - Adaptive Load Balancing (ALB)
    - Adapter Fault Tolerance (AFT)
- **Task Mechanism with Scheduling**
  - Backup Utility
  - Fibre Channel Support
  - Multi-CPU Support
  - IP-SEC



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FalconStor IPStor®

Safeguard your data across its entire lifecycle

IPStor® Benefits

- Up to 5X faster backups
- Elimination of dependence on backup windows
- Simplified, centralized backup management
- Consolidation of remote office backup
- Data compression for efficient use of backup media
- Cost-effective electronic vaulting via remote replication of backup data over IP

IPStor® Applications

- Virtual Tape Library (VTL)
  - Solves the problems associated with physical tape as backup medium
  - For use in traditional tape-centric backup/recovery environments
- Continuous Data Protection (CDP)
  - Provides disk-based data protection for recovery to any point in time
  - For use as repository for continuous protection and snapshot data
- Network Storage Server (NSS)
  - Provides primary storage with data protection capabilities

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StorTrends® iTX Software

Dual Dialect Technology – Providing both NAS + IP/SAN in ONE!

StorTrends® iTX Software Benefits

- Cost Effective: Enterprise Features at the SMB Pricing Level
- Scalability: Supports 1TB up to 256TB through Virtualization and Capacity Expansion
- Simplified: Setup and Web-GUI Configuration Wizard is Fast, Intuitive and Simple
- Performance: Superior Performance with Advanced Caching Algorithms
- Data Protection: Advanced Snapshots, CDP and Replication (Asynchronous and Snap Assisted)
- Management: Web GUI Interface for Remote Access and CLI (Command Line Interface)
  Support
- Customization: Branding and GUI Customizations for your own Company's Look and Feel

StorTrends® iTX Software Applications

- Continuous Data Technology (CDT)
  - Includes Continuous Data Protection (CDP), Continuous Data Replication (CDR) and Continuous Data Imaging (CDI)
  - Eliminate Backup Windows and Utilize Any Point in Time Data Recovery
- Information Lifecycle Management (ILM)
  - Granular Block Level Tracking and Management
  - Automatic Classification (Storage Type, RPM, Size, RAID Level, etc.)
- High Availability
  - No Single Point of Failure
  - Multi-Pathing and Load Balancing Support
- Replication
  - Asynchronous Replication
  - Snap-Assisted Replication (SAR)
  - Synchronous Replication

American Megatrends, Inc.
Worldwide Sales Contact
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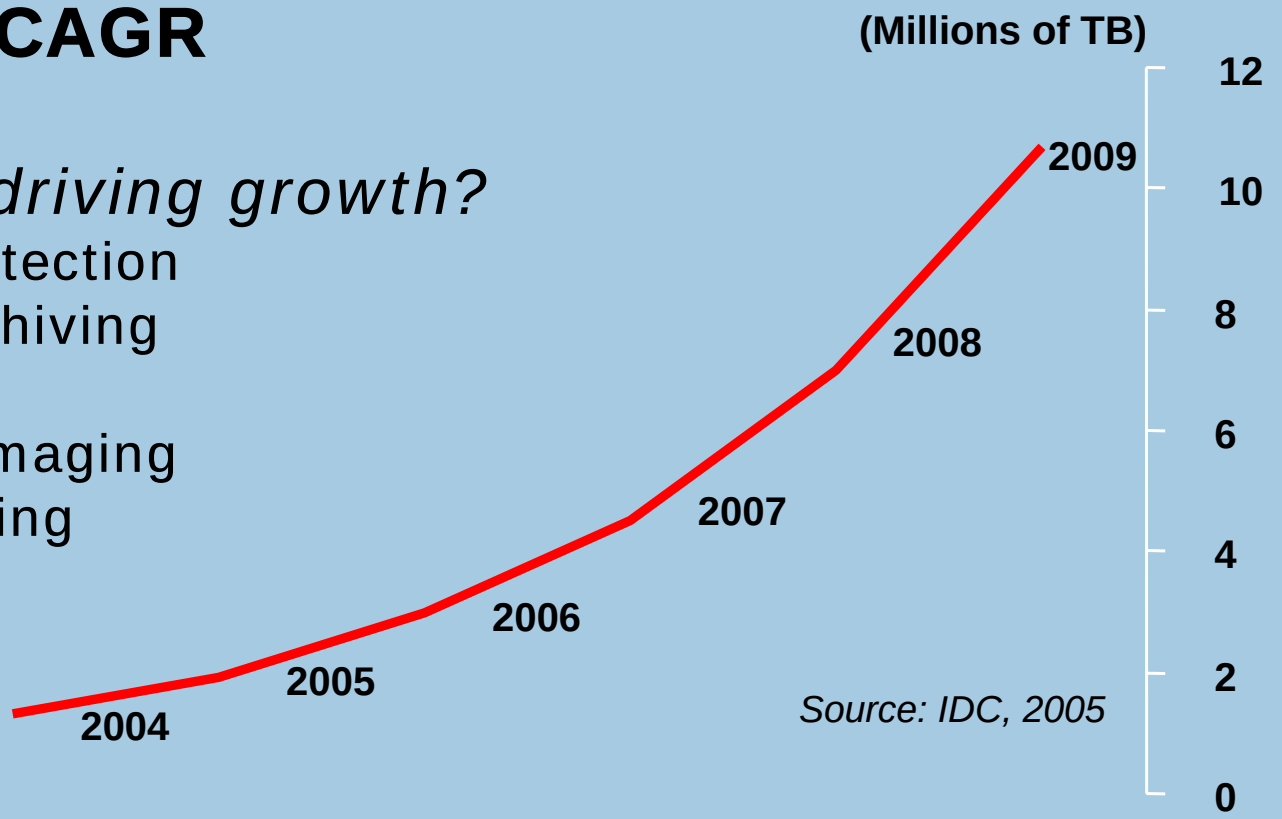
WW Storage Terabyte Forecast

Terabytes shipped grows at 52.8% CAGR

What is driving growth?

- Data Protection
- Data Archiving
- Email
- Digital Imaging
- File sharing



Data Needs Doubling Every 24 Months

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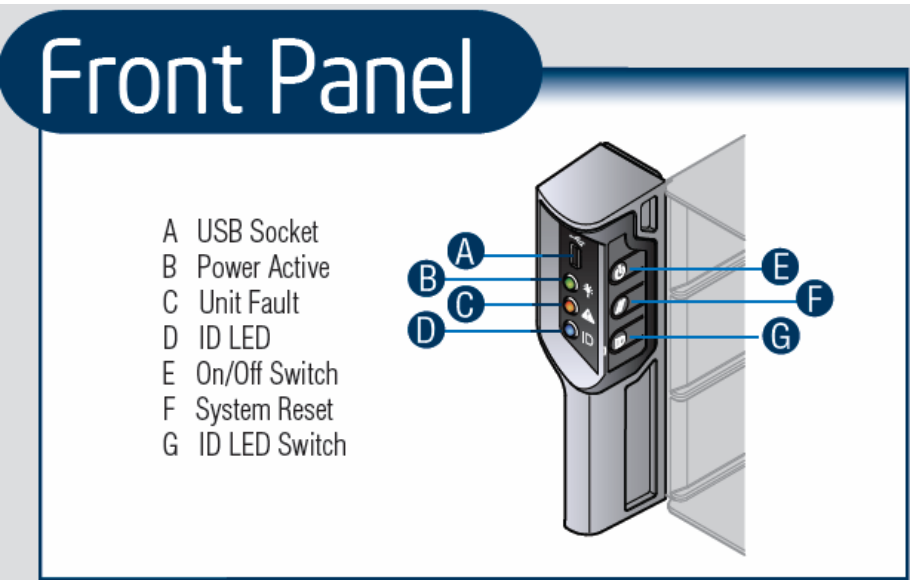
Front View



USB Socket
Mini-USB Cable comes with system

Power On
Continuous green with power

Power Fault
Continuous amber light indicates fault

Enclosure ID
Continuous blue identifies unit

On / Off Switch
Turns system on and off

System Reset
Resets system

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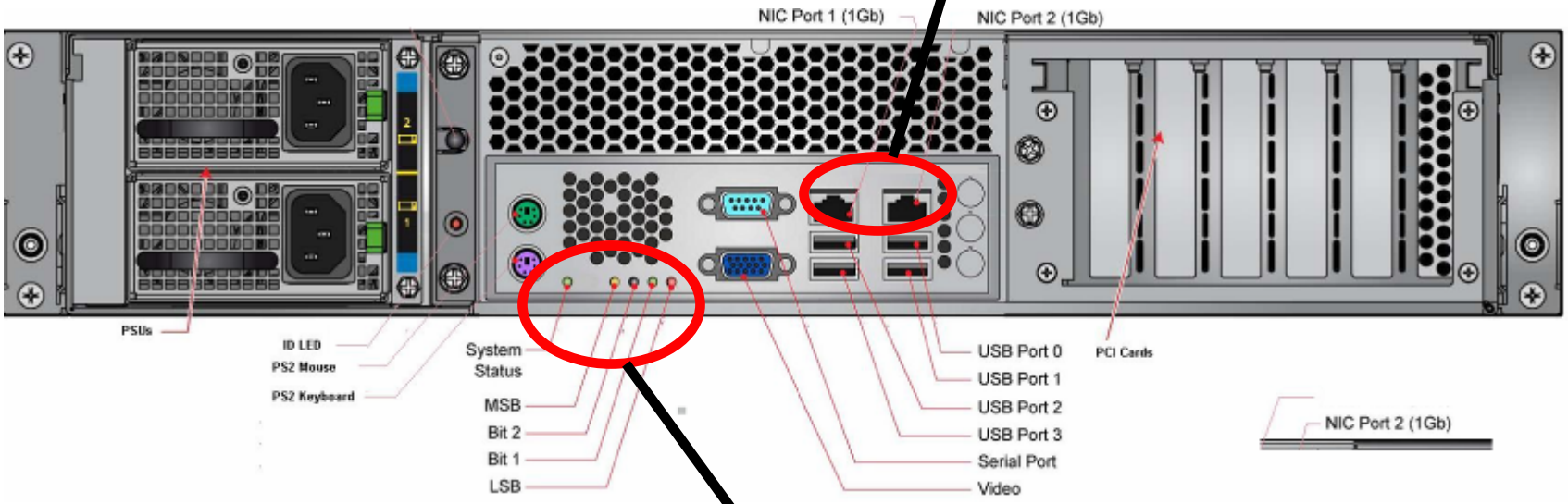
REAR PANEL

LED	LED State	Description
Left	Off	No network connection is in place
	Solid green	Active network connection is in place
	Blinking green	Transmit / receive activity is occurring
Right	Off	10 Mbps connection (if left LED is on or blinking)



- VGA
- PS2 keyboard and mouse
- Four USB Ports
- Two GB Ethernet Ports
- System Status Bits

LED	Color	Function
System Status LED	• Green • Off • Alternating Green/Amber • Amber • Green blink • Amber blink	• System OK • AC power off • System not ready • Critical fault • System degraded • Non-fatal alarm, system likely to fail
4 x Power-On Self Test (POST) LEDs	Off *Amber	System Running normally The POST LEDs toggle between red, green, amber and Off at boot up. *(Lit amber only if a failure occurs).

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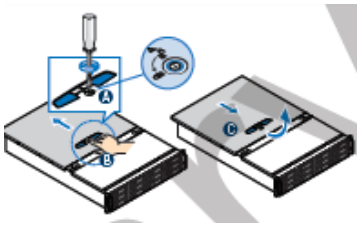
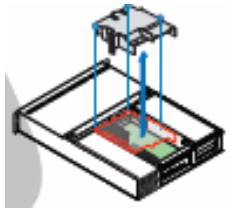
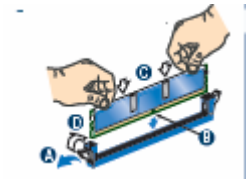
Hardware Integration
Quick Start User's Guide



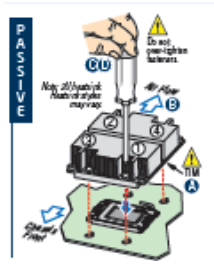
Remove Cover



Remove Air Duct

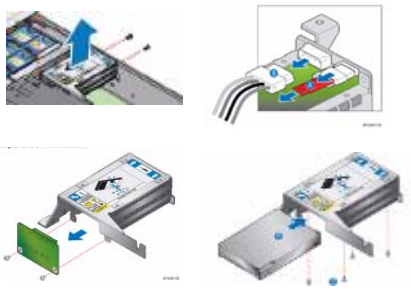


Install Memory

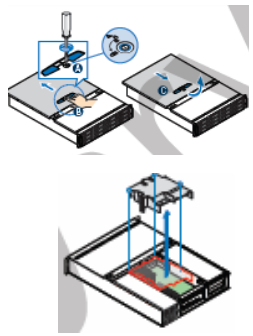


Install Processor And Passive Heat Sink

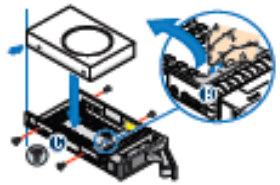
Remove Air Dam (Two Processor Only)



Install Boot Drives (optional)



Reinstall Cover and Air Duct



Install Drives into Carriers

Install Drive Carriers

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SAS versus SATA – Comparative Figures

	SATA (3.0 Gbps)	Ultra320	SAS	FC-AT
Duplex	Half	Full	Full	Full
Bus	Serial	Parallel	Serial	
Connectors	7pin	68 pin	7pin keyed	custom
Cable Length	1M internal	12m ext	6/10m int/ext	>6m external
Connection	Point-to-Point	Shared	Point-to-Point	
Error Mgmt	None	CRC	**CRC improved**	
Devices	1	15	**16384 128/exp**	>128 (loop)
Perf max MBps	300 (600)	320	**600 FullDuplx**	4-800
Seek Times	~8 ms	~3 ms	**~3 ms**	
RPMs max	10K	15K	15K	
MTBF MillnHrs	0.6 8-hour/5-day	1.2 24/7	**1.3 24/7**	
Hosts	**1**		**Multi (HW Redundancy)**	Multi
Port	Single	Single	Dual	

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Bill of Materials

SSR212MC2R (with RAID controller)	SSR212MC2 (no RAID controller)
1x 2U system chassis (including SAS backplane, cooling module, power supply enclosure) • 1x 850W power supply module • 1x Intel® Server Board S5000PSLSAS • 1x Intel RAID Controller SRCSAS144E • 1x Intel Battery Backup Unit AXXRIBBU1 • 12x Intel hard disk drive carriers (for use with SAS or SATA HDDs) • 1x 2.5” HDD internal boot drive enclosure • 2x Boot Drive SATA cables • 4 lane SAS cable	**1x 2U system chassis (including SAS backplane, cooling module, power supply enclosure)** • 1x 850W power supply module • 1x Intel® Server Board S5000PSLSAS • 12x Intel hard disk drive carriers (for use with SAS or SATA HDDs) • 1x 2.5” HDD internal boot drive enclosure • 2x Boot Drive SATA cables • 4 lane SAS to 4x SATA cable
12x HDD labels	**12x HDD labels**
1x Rail Kit	**1x Rail Kit**
1x printed Quick Start Guide	**1x printed Quick Start Guide**
1x Resource CD	**1x Resource CD**
1x Torx Screwdriver	**1x Torx Screwdriver**

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Spares and Accessories

PRODUCT CODE	Description
FMCCHASSIS	**SSR212MC2 chassis: including backplane, enclosure management card , front panel board, power supply cage**
FMCCABLES	**SSR212MC2 cable kit, including: BBU cable, boot drive SAS, front panel flex cable, front panel SSI**
FMCSAS4XCBL	**SSR212MC2 4 lane SAS fan out cable with four 7 pin SATA connectors (mini-SAS to 4x SATA)**
FMCSASCBL	**SSR212MC2 4 lane SAS cable (mini-SAS to mini-SAS)**
FXSDRVCARR	**12 pack HDD carrier set, along with 1 torx driver and HDD label set**
FMCBOOTENCL	**SSR212MC2 2.5” boot drive enclosure**
FMCRAILKIT	**SSR212MC2 Rail kit**
Hard Drives	
AMCSAS300	**300GB 10k RPM SAS hard disk drives**
AMCSATA750	**750GB 7.2k RPM SATA II hard disk drive**

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Spares (cont.)

PRODUCT CODE	Description
FMCCHASSIS	**SSR212MC2 chassis FRU: including backplane, enclosure management card , front panel board, power supply cage**
FMCCABLES	**SSR212MC2 cable kit, including: BBU cable, boot drive SAS, front panel flex cable, front panel SSI**
FMCSAS4XCBL	**SSR212MC2 4 lane SAS fan out cable with four 7 pin SATA connectors (mini-SAS to 4x SATA)**
FMCSASCBL	**SSR212MC2 4 lane SAS cable (mini-SAS to mini-SAS)**
FXSDRVCARR	**12 pack HDD carrier set, along with 1 torx driver and HDD label set**
FMCBOOTENCL	**SSR212MC2 2.5” boot drive enclosure**
FMCFANS	**SSR212MC2 Fan Kit (5 Pak)**
AMC850WPS	**850W Power Supply HW Accessory**
FMCRAILKIT	**SSR212MC2 Rail kit**

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Spares (cont.)

Product Code	Description
FMCPKG	SSR212MC2 packaging (external box assembly)
FMCSASX	SSR212MC2 SAS expander card
FMCAIRBAFFLE	SSR212MC2 processor and memory air baffles
BB5000PSLSAS	10-pack of Intel Server Board S5000PSLSAS with integrated 4-port SAS, G1 Blackford Chipset
SRCSAS144E	Intel® RAID Controller SRCSAS144E (Boiler Bay) - PCIe x4, 8P (4 int/4 ext) SAS RAID Controller - Intel 80333 IOP @ 500 MHz, 128MB embedded memory. RoHS Compliant.
AXXRIBBU1	Battery Backup unit for Intel RAID controller SRCSAS144E (Stockton Battery)

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Storage expansion using JBODs

The SSR212MC2R(RAID) supports a JBOD expansion unit

- JBOD = “Just a Bunch of Disks”
- Add an additional 12 or 16 disks to each SSR212MC2 unit
- SAS or SATA expansion connected to MC2 using Dual 4 Lane SAS Cable
- Drive Carriers and Drives are different

Currently supported units

- Check out the latest SSR212MC2 THOL

Vendor	Part Number	Product Description
Xyratex	RS-1603-E3-EBD-1	**3u rack mount 16 HDD SAS/SATA JBOD**
Promise	VT-J300S-DS	**2u rack mount, 12 HDD SAS/SATA JBOD**

Xyratex

RS-1603-E3-EBD-1

Promise
VT-J300S

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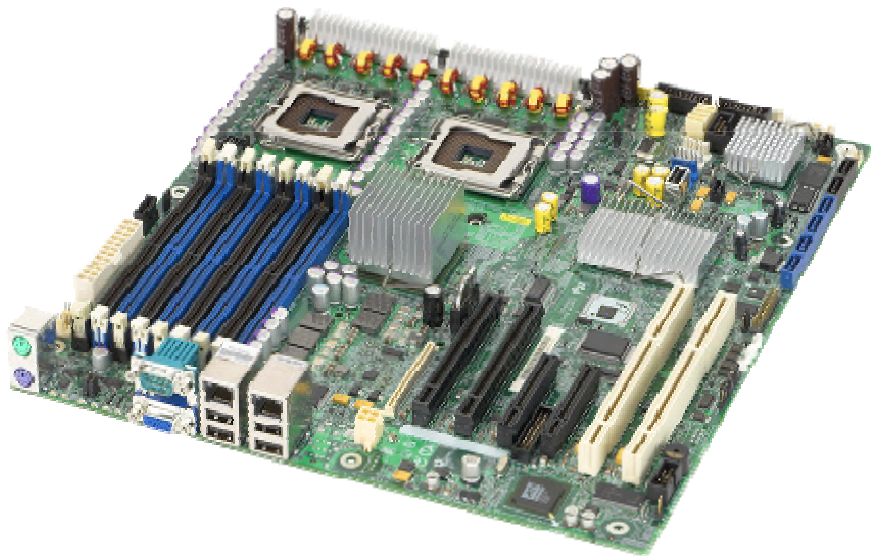
Learn About Intel® Server Boards

Intel® Server Board S5000PSL

A high-performance server board supporting two Dual- or Quad-Core Intel® Xeon® processors



High performance, I/O flexibility, dependability and manageability

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Intel® Server Board S5000PSL– Technical Features

- **Processing**
  - Dual and Quad-Core Intel® Xeon® processor 5000-series support
  - Intel 5000P chipset
- **Memory**
  - 8 fully buffered DDR2 FBDIMM sockets
    - 2 Minimum 512MB FBDIMMS
  - 32 GB max capacity
  - Memory mirroring and sparing (available post-launch)
  - Quad-channel memory architecture
- **I/O**
  - 6 I/O Slots
    - 2 x8 PCI Express* (x16 connectors)
    - 2 x4 PCI Express (x8 connectors)
    - 1 PCI-X 133/100 MHz
    - 1 PCI-X 100 MHz
  - Integrated graphics (ATI ES-1000 with 16-MB DDR SDRAM)
  - Dual-Gigabit Ethernet with Intel® I/O Acceleration Technology

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Intel® Server RAID SAS Controller

SRCSAS144E

- 4 port internal, 4 port external HW RAID Controller
- PCI-e, SAS RAID Adapter, 128MB embedded
- Low Profile Form Factor height only. 7.71" x 2.535"

Intel® RAID Smart Battery AXXRIBBU1 **is optional accessory**

- Compatible with SAS 1.0 Software Stack
  - Same firmware, drivers, and utilities as ROMB and other SAS add in cards
  - Same OS management utilities as SW RAID 0/1/10 & SW RAID 5

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